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- (11) Japanese Laid-Open Patent Application No. 63-85660
- (43) Laid-Open Date: April 16, 1988
- (21) Application No. 61-230087
- (22) Application Date: September 30, 1986
- (71) Applicant: Toshiba Co., Ltd.
- (72) Inventor: Yoshiharu TANIYAMA
- (74) Agent: Patent Attorney, Yasuo MIYOSHI, et al.

SPECIFICATION

1. Title of the Invention: TONER CARTRIDGE FOR USE IN
ELECTRONIC COPY MACHINE

2. Claim

(1) A toner cartridge for use in an electronic copy machine, including a toner stirring paddle provided within the toner container, and a toner transporting auger located under the paddle, characterized in that a toner discharge hole is provided in a position in a horizontal direction with respect to the auger, adjacent to one end of the auger.

3. Detailed Description of the Invention

[Object of the Invention]

(Field of Industrial Application)

The present invention relates to an improvement in a

toner cartridge for use in an electronic copy machine. In more detail, this invention relates to an improved toner cartridge for use in an electronic copy machine, which can ensure a stabilized toner discharge amount and prevent a toner clogging.

(Related Art)

In general, a toner cartridge for supplying a toner to an electronic copy machine is constituted in a manner shown in Figs. 4(A), (B) and (C).

Namely, as shown in Fig. 3, a toner cartridge 10 comprises a container 1 for accommodating an amount of toner, a toner stirring paddle 2 provided within the container 1, a toner transporting auger 3 provided under the toner container 1.

In fact, the paddle 2 is so provided that it can rotate about a shaft 5, along with the rotation of the auger 3.

Further, the auger 3, by virtue of an external driving apparatus (not shown), can cause the rotation of a driving gear 4, as well as the rotation of the paddle 2.

Moreover, on one side of the container 1 there is formed a toner discharge hole 6 facing one end 3A of the auger 3, forming an arrangement allowing the toner to be discharged therethrough.

However, if necessary, the above discharge hole 6 may be covered by a cover 7, so that it is possible to prevent

the dropping down or flying about of the toner when not in use.

In this way, the toner T supplied to the container 1 is stirred by the paddle 2 and thus moved downwardly. Therefore, the toner is transported by the auger 3, supplied to a development device (not shown) through the discharge hole 6.

(Problems to be Solved by the Invention)

However, the above described conventional toner cartridge, as shown in Fig. 4(B), is associated with the following problem. Namely, since the discharge hole 6 is provided in the vicinity of one end of the auger 3 in a position perpendicular to the auger 3, toner T can drop down as a free fall through the discharge hole 6. As a result, the toner discharge amount will become irregular, and toner will get clogged in the vicinity of the discharge hole 6.

In fact, an irregular supplying amount of the toner will cause a produced copy too dark or too shallow in its color, hence remarkably lowering the copy quality.

The present invention has been made and accomplished to solve the above problems existing in the toner cartridge of the above described conventional electronic copy machine.

Therefore, it is an object of the present invention to provide an improved toner cartridge for use in an electronic copy machine, capable of ensuring a stabilized toner

discharge amount and preventing a toner clogging.

[Constitution of the Invention]

(Means of Solving the Problems)

Namely, the gist of the present invention is to provide an improved toner cartridge for use in an electronic copy machine, including a toner stirring paddle provided within the toner container, and a toner transporting auger located under the paddle, characterized in that a toner discharge hole is provided in a position in a horizontal direction with respect to the auger, adjacent to one end of the auger.

(Operation)

Since the toner cartridge of the present invention has a toner discharge hole which is provided in a position in a horizontal direction with respect to the auger and is adjacent to one end of the auger, it is possible for the discharge of the toner to be dependent on a pressure of the auger, thereby keeping a toner discharge amount at a constant level, and completely preventing the clogging of the toner in the vicinity of the discharge hole.

(Description of Embodiment)

In the following, with reference to the accompanying drawings, a detailed description will be made to explain a toner cartridge which is for use in an electronic copy machine, and is formed according to the present invention.

Fig. 1 is an explanatory cross sectional view showing

an electronic copy machine which is suitable to incorporate an improved toner cartridge formed according to the present invention. Fig. 2 is a schematic view showing the same constitution. Fig. 3(A) is an explanatory cross sectional view showing the toner cartridge of the present invention, (B) is an explanatory perspective view showing the front end of an auger, and (C) is an explanatory cross sectional view illustrating the same constitution.

At first, with reference to Fig. 1 and Fig. 2, the description will be given to explain the summary about the constitution and the function of an electronic copy machine which is typically an appropriate apparatus to incorporate the toner cartridge formed according to the invention.

Referring to Fig. 1, on the upper surface of the copy machine main body 11 there is provided an original document mounting tray 11A capable of reciprocating in accordance with the copying process. In substantially the central position of the main body 11 is rotatably supported a photosensitive drum 13 which serves as a drum-like development section and rotates in synchronism with the reciprocating movement of the original document mounting tray 11A.

Further, between the photosensitive drum 13 and the original document mounting tray 11A there is provided an exposure device 16 consisting of a lamp 12, a lens 14 and a

mirror 15. In this way, a light can be used to irradiate the original document mounted on the original document mounting tray 11A, with its reflected light being directed to the photosensitive drum 13, thereby effecting an image formation on the base of the original document.

Moreover, surrounding the photosensitive drum 13 there are provided, in the following order and arranged from an image formation position along the rotating direction of the photosensitive drum 13, a development device 17, a transfer device 18, a stripping device 19, an electric charge removal device 20, a cleaning device 21, an electric charge removal lamp 22, and an electric charging device 23. In this way, toner can be supplied from the toner cartridge 10 to the development device 17.

Further, within the copy machine main body 11 there is provided a transport path 24 for transporting each transfer paper P through a space formed between the photosensitive drum 13 on one hand and the transfer device 18 and the stripping device 19 on the other. The base end of the transport path is arranged to face a manually-operated paper feeding guide 25 provided on one side of the main body 11, or to face a paper feeding device 27 provided for independently feeding papers from a paper feeding cassette 26, while the terminal end of the transport path is arranged to face a paper discharge tray 29 through an image fixing

device 28.

In addition, as shown in Fig. 2, the copy machine main body 11 can be separated along the transport path 24 into an upper unit 30 and a lower unit 31. Then, one end of the upper unit 30 is freely pivotably supported by the lower unit 31, thereby forming an engagement which can be opened apart or closed together.

However, at first, the electric charging device 23 and the light exposure device 16 are operated so that an electro-static potential image corresponding to an original document is formed on the photosensitive drum 13.

Afterwards, the electro-static potential image receives an amount of toner T by virtue of the development device 17 so as to be developed. In this way, an image consisting of the development agent can thus be formed on the photosensitive drum 13.

In fact, this image consisting of the development agent is transferred through the transfer device 18 to the transfer paper P which has been fed thereto by the paper feeding device 27. Then, the transfer paper P mounting the image consisting of the development agent and transferred hereto is stripped from the photosensitive drum 13 by the stripping device 19. Subsequently, the image consisting of the development agent is fixed by the fixing device 28, so as to be discharged to the paper discharge tray 29.

On the other hand, an amount of toner not transferred to the transfer paper P but remaining on the photosensitive drum is subjected to an electric charge removal treatment in an electric charge removal device 20, and then removed therefrom by virtue of the cleaning device 21. In this way, the photosensitive body 13 with the remaining toner removed therefrom, is also subjected to an electric charge removal treatment in the electric charge removal lamp 22, thereby allowing the process to enter a next step.

The toner cartridge 10 of the present invention for use in the above electronic copy machine, as shown in Fig. 3(A), (B) and (C), comprises a container 1 for containing toner T, a toner stirring paddle 2 provided in the container 1, and a toner transporting auger 3 provided lower part of the container 1. The paddle 2 is provided to rotate about shaft 5, cooperating with the rotation of the auger 3. Further, the auger 3 is provided also to be rotated through a driving gear 4 which is driven by an external driving device (not shown), as well as to provide a rotating force to the paddle 2.

Further, on one side of the above toner container 1 there is formed a toner discharge hole 6 facing one end 3A of the auger 3, thereby making it sure for the toner T to be discharged therethrough. In particular, the toner discharge hole 6, as shown in Fig. 3(B), is formed at an end position

along the horizontal direction with respect to the auger 3. In this way, the toner T can be transported by a pressure of the auger 3, so as to be discharged from one side of the auger 3 of the container 1.

However, in the accompanying drawings, reference numeral 7 represents a cover which can be provided in view of a real need for preventing the dropping down and flying about of the toner T which has not been used.

Therefore, the toner T supplied to the toner container 1 is caused to move downwardly by virtue of an agitation effected by the paddle 2, and discharged from the discharge hole 6, all depending upon a pressure of the auger 3, so as to be supplied to the development device (not shown). As a result, the toner discharge amount can be constantly maintained at an unchanged level, thus making it possible to completely eliminate an undesired possibility that toner will get clogged in the vicinity of the toner discharge hole 6.

[Advantage of the Invention]

As described in detail above based on the above-embodiment of the present invention, since the toner discharge depends on the pressure of the auger, the toner discharge amount can be made constant, and it is possible to completely eliminate an undesired possibility that toner will get clogged in the vicinity of the toner discharge hole.

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Therefore, with the use of the electronic copy machine incorporating the toner cartridge of the present invention, it is possible to obtain a high quality copy.

4. Brief Description of the Drawings

Fig. 1 is an explanatory cross sectional view of an electronic copy machine which is suitable to incorporate an improved toner cartridge formed according to the present invention. Fig. 2 is a schematic view showing the same constitution. Fig. 3(A) is an explanatory cross sectional view showing the toner cartridge of the present invention, (B) is an explanatory perspective view showing the front end of an auger, and (C) is an explanatory cross sectional view illustrating the same constitution. Fig. 4(A) is an explanatory cross sectional view showing a conventional toner cartridge, (B) is an explanatory perspective view showing the front end of an auger, and (C) is an explanatory cross sectional view illustrating the same constitution.

- 1 ... container
- 2 ... toner stirring paddle
- 3 ... toner transporting auger
- 4 ... driving gear
- 5 ... shaft
- 6 ... toner discharge hole
- 7 ... cover

- 11 -

7 ... toner
10 ... toner cartridge

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G 03 G 15/09 112 昭63-211

審査請求 本請求 発明の数 1 (全5頁)

④ 発明の名称 電子複写機のトナーカートリッジ
④ 特 昭61-230087
④ 出 昭61(1986)9月30日
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明 細 書

1. 発明の名称
電子複写機のトナーカートリッジ
2. 発明の概要
(1) トナー収容容器の内部にトナー供給用のパドルを、更にその下方を成すトナー供給用のオーガーを配置したトナーカートリッジにおいて、前記オーガーは、オーガーと水平方向の位置に、トナー排出を成すこととされる電子複写機のトナーカートリッジ。
[発明の要約]
(産業上の利用分野)
本発明は、電子複写機のトナーカートリッジの改良に係り、さらに詳しくは、トナー供給部が固定しており、しかもトナー供給部を固定した状態で電子複写機のトナーカートリッジに装着するのである。
[発明の要約]
一、電子複写機の改良に係るトナーを供給

するトナーカートリッジに関する発明 (A)、(B) および (C) に基づくものである。
すなわち、前記において、トナーカートリッジ 10 は、トナー T を供給する容器 1 と、この容器 1 の内部に設けられたトナー供給用パドル 2 と、前記トナー供給用パドル 2 の下方に設けられたトナー供給用オーガー 3 とから構成されている。
前記パドル 2 は、前記オーガー 3 の回転軸 4 を中心として回転する。
また、オーガー 3 は、図示していない外周部 5 を有し、前記オーガー 3 を回転させるためのモータ 6 が設けられており、トナー T が排出されるように構成されている。
なお、前記パドル 2 には、前記オーガー 3 の回転軸 4 に沿って設けられており、トナー T が排出されるように構成されている。
したがって、前記容器 1 に供給されたトナー T

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(C)

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- 1-収容部
- 2-フタ-開閉機構
- 3-フタ-開閉機構
- 4-開閉機構
- 5-開
- 6-フタ-開閉機構
- 7-フタ-
- 8-フタ-
- 9-フタ-開閉機構

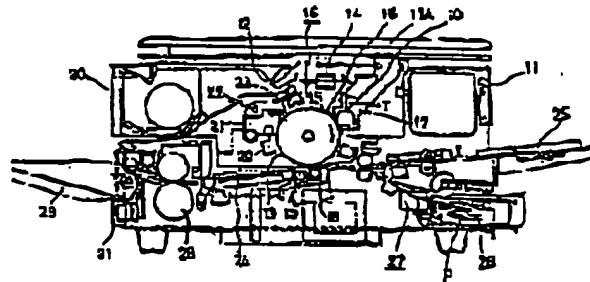


図 1

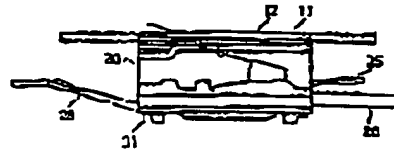
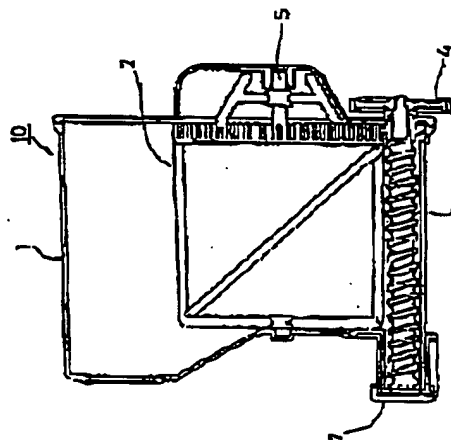


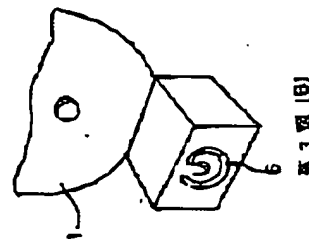
図 2



(A) 図 3



(B) 図 3

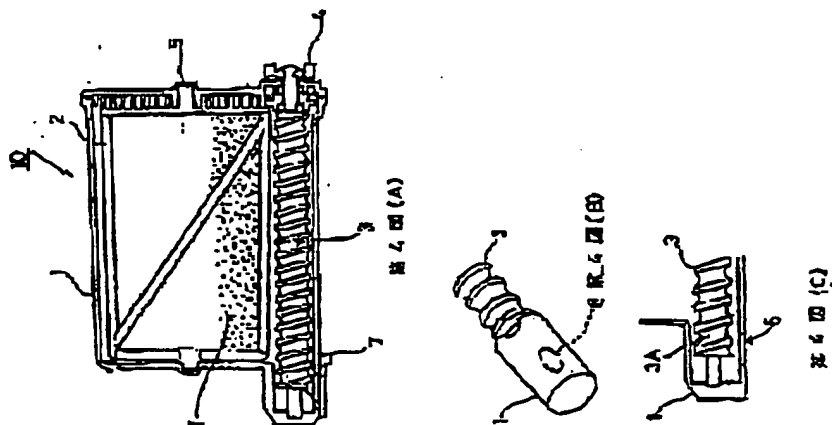


(C) 図 3

(5)

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特開昭63-85660 (5)



AK